



THE RETROFIT **IMPERATIVE**

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Owner, Principal **PASSIVE TO POSITIVE**

MATT FINE, CPHC, LEED AP
Project Manager **PEABODY ARCHITECTS**

YOU ONLY GET ONE

HOW MUCH CARBON IS FROM NEW CONSTRUCTION?



REPEATABLE + ACHIEVABLE



CREDITS: DESIGN AND PHOTOGRAPHY, ZA+D, LLC

PROJECT BACKGROUND

- (3) BLDGS. / 36 (2) BR UNITS
- 675 NRSF EA.
- PARTIAL BASEMENT / CRAWL SPACE
- (3) STORIES

WASTEFUL AND OUT-DATED SYSTEMS

PRE-RETROFIT

NO MANAGEMENT OF
CONDENSATION PLANE TEMPS.

MOLD GROWTH ASSURED!



PASSIVE DESIGN + “BUILDING SCIENCE”

Healthy and efficient buildings – *begin with*
PASSIVE AND PREVENTIVE DESIGN

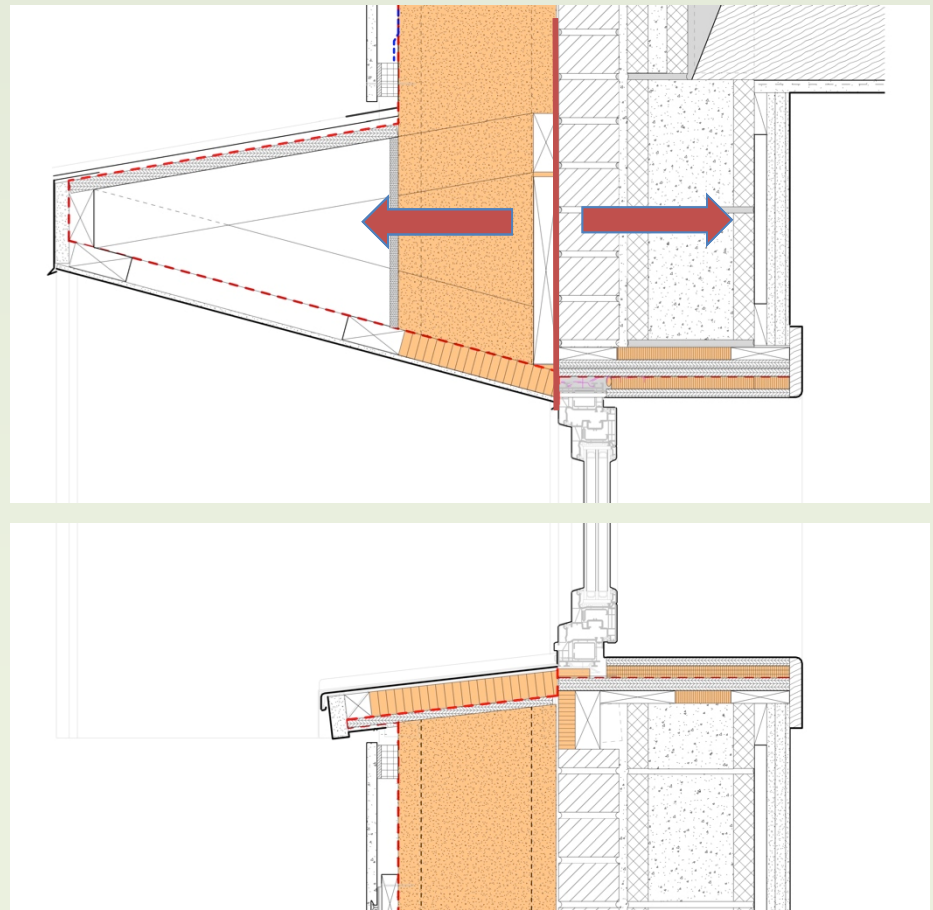




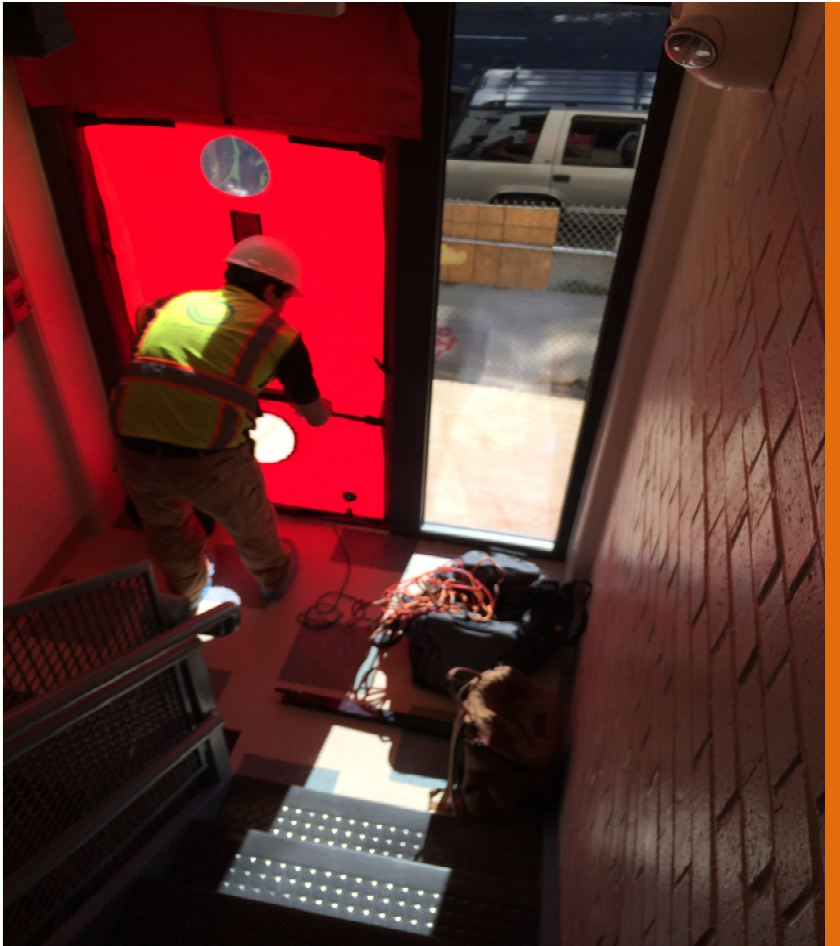
CREATING THE INSULATION CAVITY

VAPOR OPEN
ASSEMBLIES DRY TO
BOTH SIDES

MANAGEMENT OF
FIRST CONDENSATION
PLANE TEMPERATURES



VAPOR OPEN ASSEMBLIES FOR
HEALTH, SAFETY, AND
DURABILITY



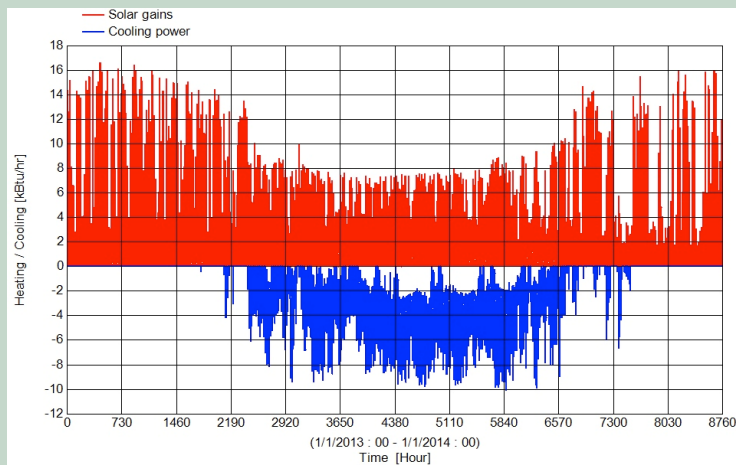
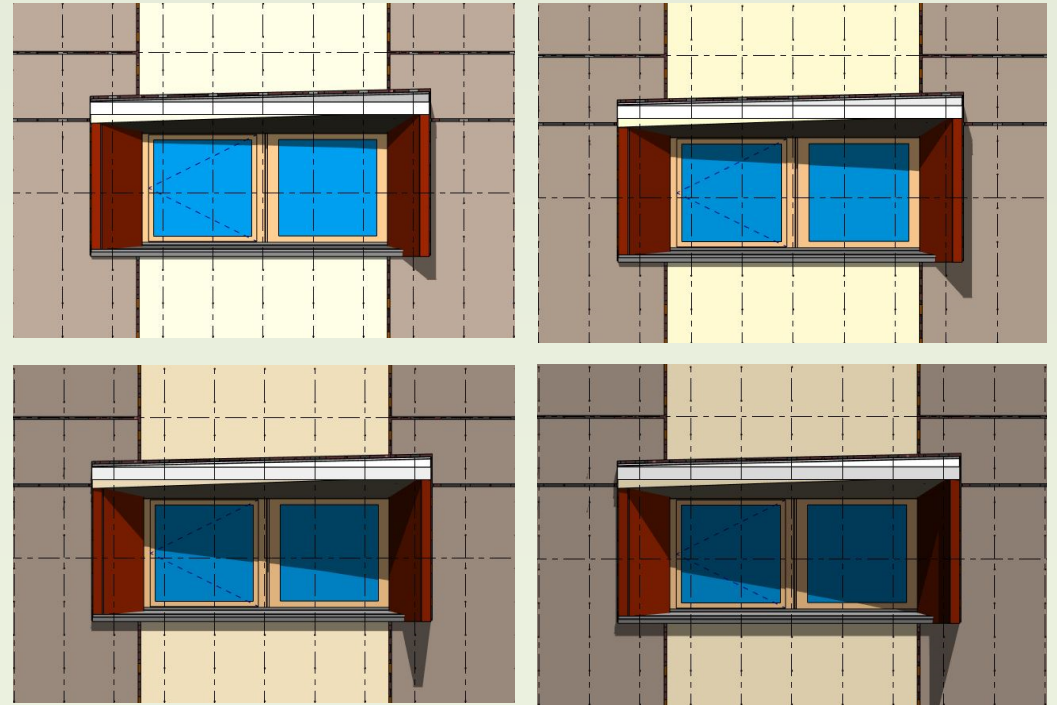
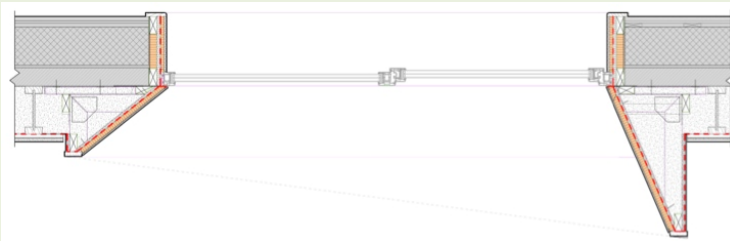
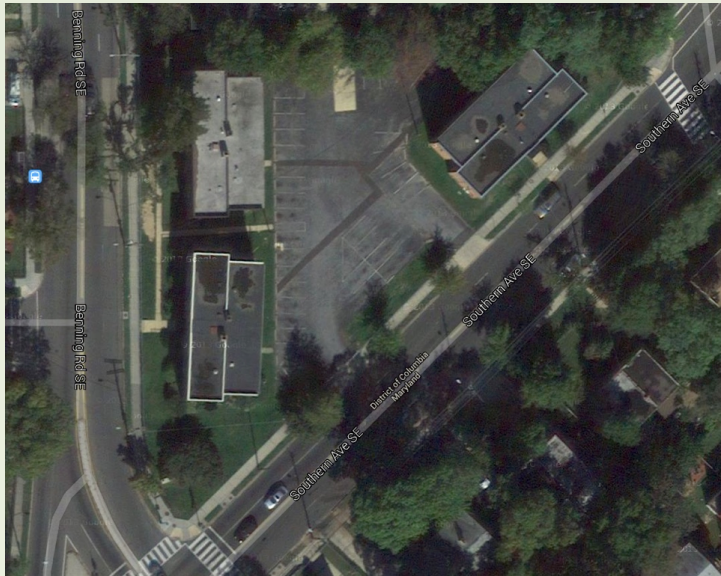
AIR TIGHT LAYER DESIGNATION + SEQUENCE

ROBUST DESIGN + CONSTRUCTION MEASURES

- PROVIDE ROBUST, *ABOVE CODE*, ENVELOPE W/ MINIMAL THERMAL BRIDGES
- AIRTIGHTNESS THAT IS 5X THE STANDARD THRESHOLD
- FOR THE “HOLES” IN THE ENVELOPE, INSERT HIGH PERFORMANCE SYSTEMS
- MANAGE SOLAR GAIN WITH WINDOW "APERTURES"
- A RESILIENT SKIN (RAINSCREEN)



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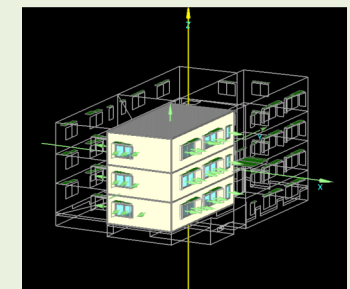
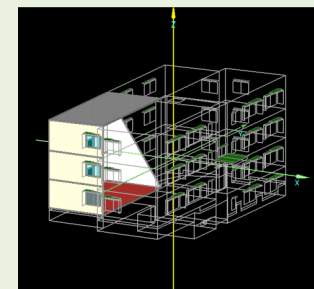
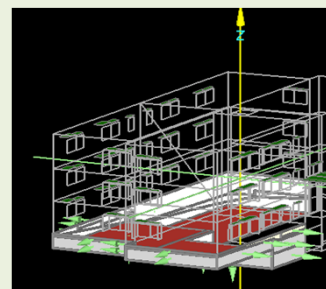
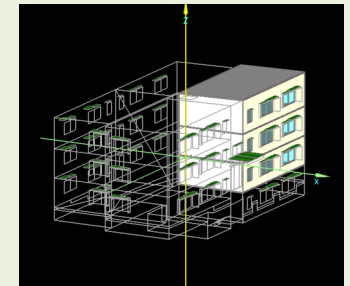
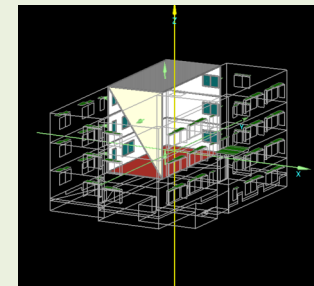
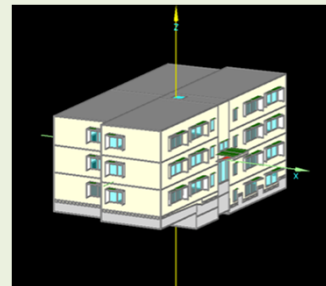
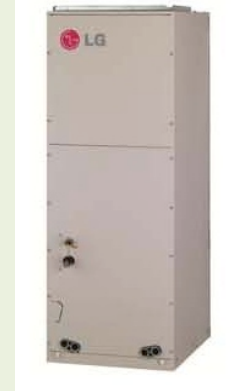


SOLAR GAIN WHEN YOU WANT IT
AND NOT WHEN YOU DON'T

OPTIMIZING COMFORT

HEATING AND COOLING: CHALLENGES

- MICRO-SYSTEMS FOR MICRO LOADS
- LATENT LOAD CONTROL
- DISTRIBUTION
- ZONING
- BETTER EQUIPMENT COSTS MORE



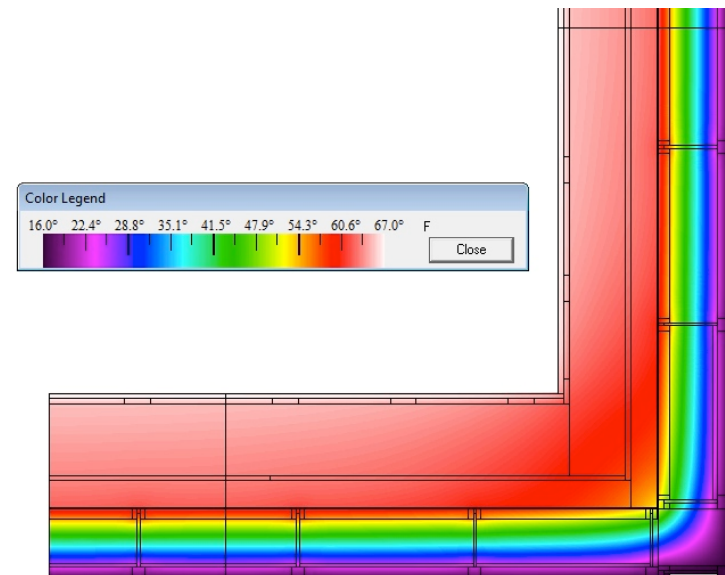
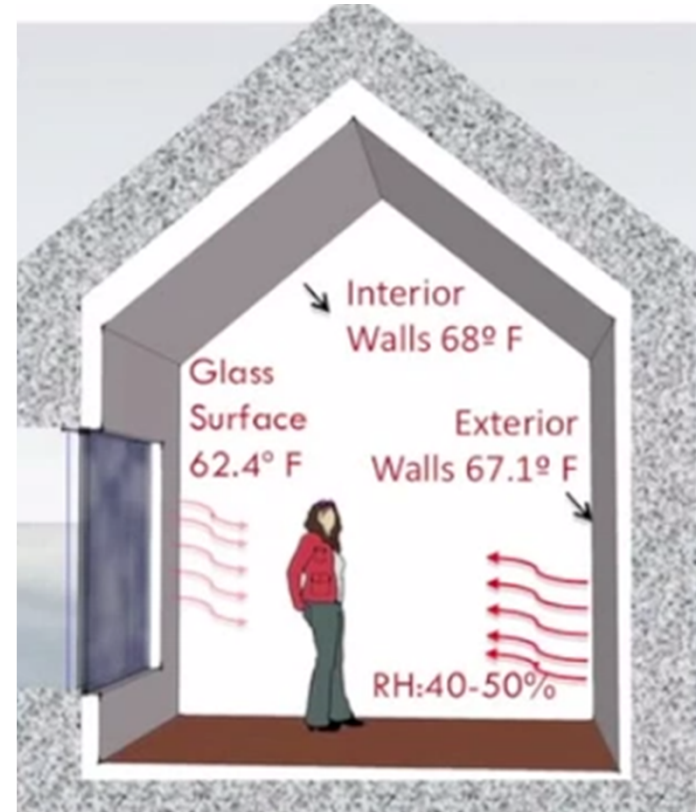
- ATYPICAL APPROACH
- MECHANICAL CODE REQUIREMENTS
- FIRE CODE REQUIREMENTS
- LATENT LOAD CONTROL
- SEEN AS ADDED COST

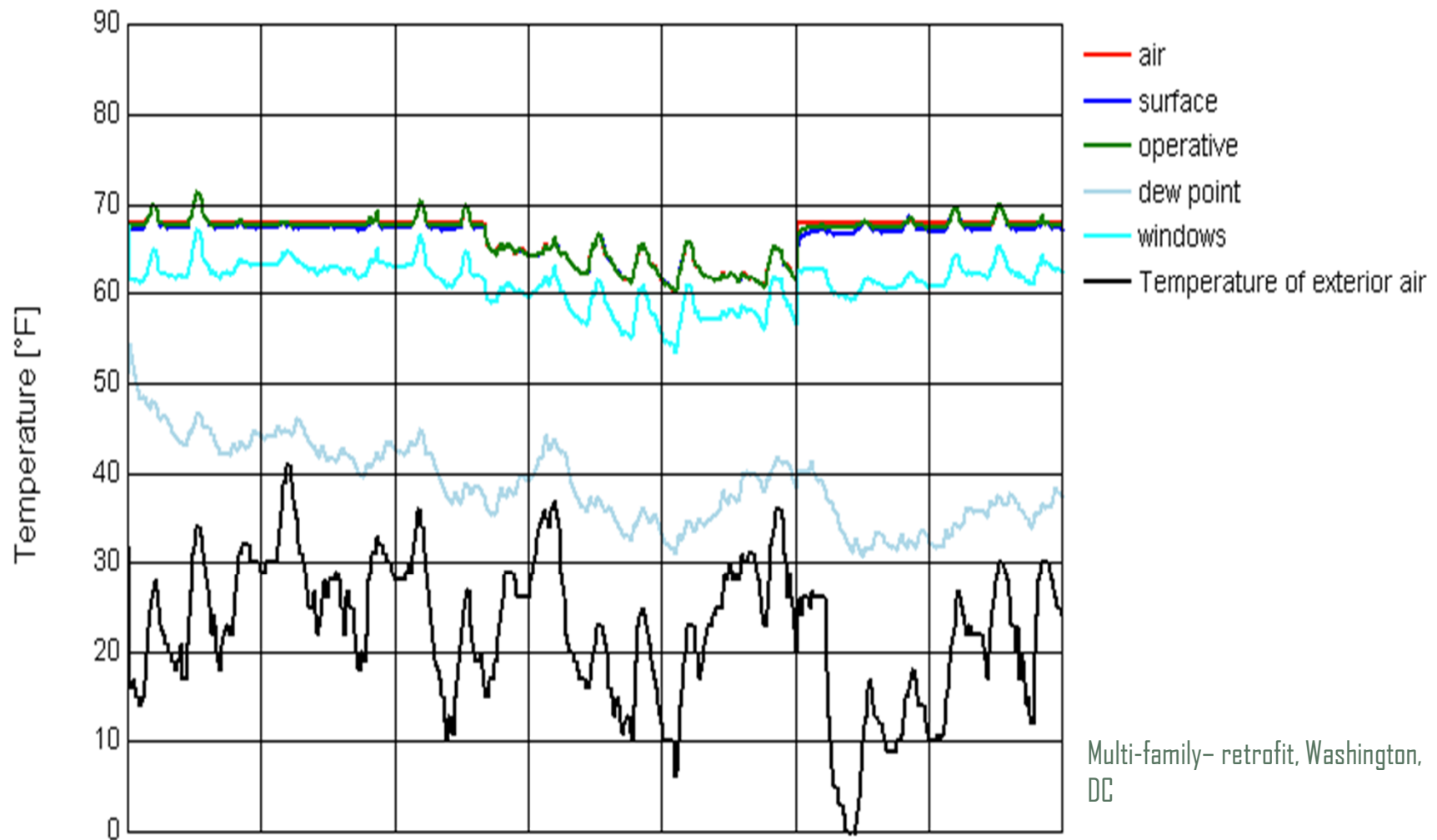


ENVELOPE + OCCUPANT COMFORT:

COMFORT FACTORS

- AIR TEMPERATURE
- RELATIVE HUMIDITY
- AIR VELOCITY
- RADIANT SURFACE TEMP.





ONE WEEK POWER OUT IN JANUARY:
RESILIENT COMMUNITIES START WITH
PASSIVE SURVIVABILITY



Passive to **POSITIVE**

PASSIVE HOUSE AND
LOW IMPACT DESIGN



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